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ABSTRACT

The Wycheproof township in New South Wales (Australia) is the regional center for a grain farming community. The Wycheproof Education Centre was formed by the merger of a separate primary and secondary school (on one site with existing buildings), into a single governing body that is educationally structured into junior, middle, and senior sections. In this report the authors, architects and educational planners, advise on the feasibility of reusing existing buildings and on providing community services. In addition, building criteria and a schematic design for a new school are presented. The report presents the background of the school; the characteristics of the community and the facility needs expressed by members of the community; and an analysis of the school site and its relationship to the climate. The proposed building plans and their estimated costs are covered in the final two sections. Numerous illustrations show existing site and buildings as well as features of the proposed school and grounds. The proposed school design provides for energy savings by substantially reducing reliance on artificial lighting, heating, cooling, and ventilation and allows for future installation of solar space heating and solar air conditioning equipment. Because of these factors, the design could serve as a model for the design of institutions in arid zones. (MLF)

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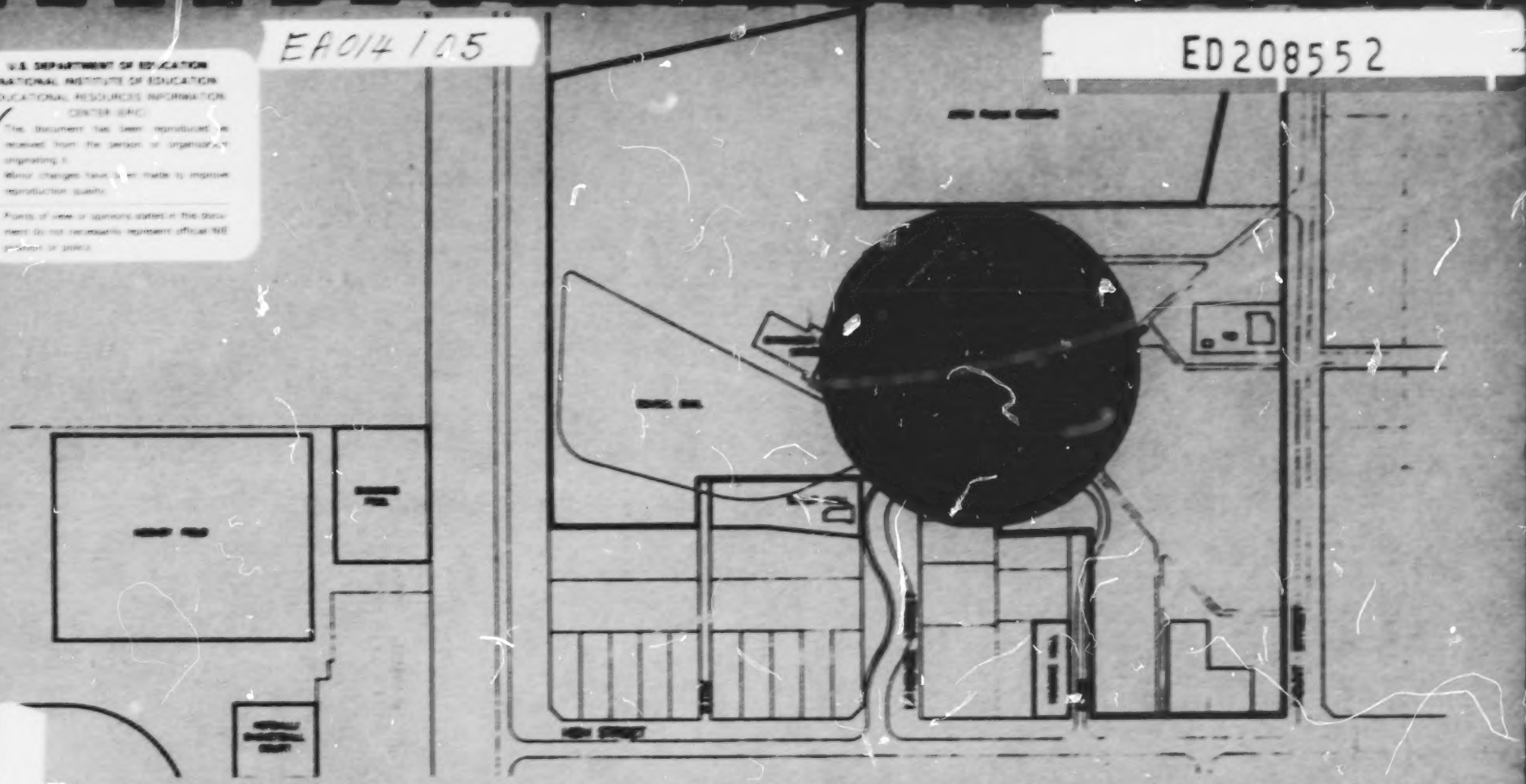

WYCHEPROOF EDUCATION CENTRE

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WYCKEPROOF EDUCATION CENTRE

October 1978

Sweetnam and Godfrey - Architects and Educational Planners
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Job 77011

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SUMMARY

1.0 INTRODUCTION

The Wycheproof Education Centre is a thirteen-year school which has evolved from a long-established Higher Elementary School. In 1976 the School Council produced an educational specification and an architect's brief to provide a basis for future development and in late 1977 Sweetnam and Godfrey, architects and educational planners, were engaged by the School Council to undertake a feasibility study.

2.0 THE WYCHEPROOF COMMUNITY

Wycheproof is a demographically stable, closely-knit community in the south-eastern Mallee.

A survey of community facility needs at the school has indicated a desire for exhibition space, a small auditorium/rehearsal room, a meeting room, games and indoor sporting facilities and associated ancilliary spaces.

3.0 THE SCHOOL SITE AND CLIMATE

The school site is located on the western slopes of Mt Wycheproof on exposed and superficial granite with gradients of up to 1:10. Vegetation is generally sparse and ground cover fragile, and in some areas destroyed by heavy usage. The existing school buildings are located in the south-western part of the site. The secondary facilities are accommodated in portable classrooms and the primary school in the original permanent buildings.

The climate is hot and arid with a wide diurnal range of temperatures throughout the year. Rainfall is variable and low. The site is exposed to hot, dust-laden northerly to westerly winds but is otherwise suited to outdoor classes.

Access to the school is predominantly from High Street.

4.0 EXISTING BUILDINGS

A study of the engineering, functional and economic aspects of re-using the existing permanent buildings has revealed a mixed picture, with functional disadvantages and only marginal economic benefits. It has been decided not to re-use the buildings in the scheme.

5.0 RATIONALISATION OF THIRTEEN YEAR FACILITY STANDARDS

The school requires fully integrated primary and secondary facilities. It is educationally structured into junior, middle and senior sections. Enrolment projections show a slight overall tendency to increase up until 1985, to a figure in the 380s.

Analysis of the curriculum has indicated the immediate need for 24 Learning areas, generally of a much smaller size than in standard guidelines. These are made up of:

Junior School	4 GLAs of 35 seats
	1 multi-purpose/Audio-Visual Room
Middle School	2 GLAs of 35 seats
	1 GLA of 24 seats
	1 GLA of 18 seats
	1 GLA of 12 seats
	1 Woodwork Room
Senior School	4 GLAs of 24 seats
	1 GLA of 18 seats
	1 GLA of 6 seats
	1 Typing Room
	1 Home Economics Room
	1 Science/Biology Laboratory
	1 Chemistry/Physics Laboratory
	1 Needlecraft Room
	1 Art/Craft Room
	1 Graphics Room

The Library, Staff/Admin, Canteen and Gymnasium are all internally rationalised to accommodate both primary and secondary requirements. Community requirements are also incorporated where appropriate.

The total nett floor area required is $3382m^2$.

6.0 SCHEMATICS PROPOSAL

6.1 Zoning

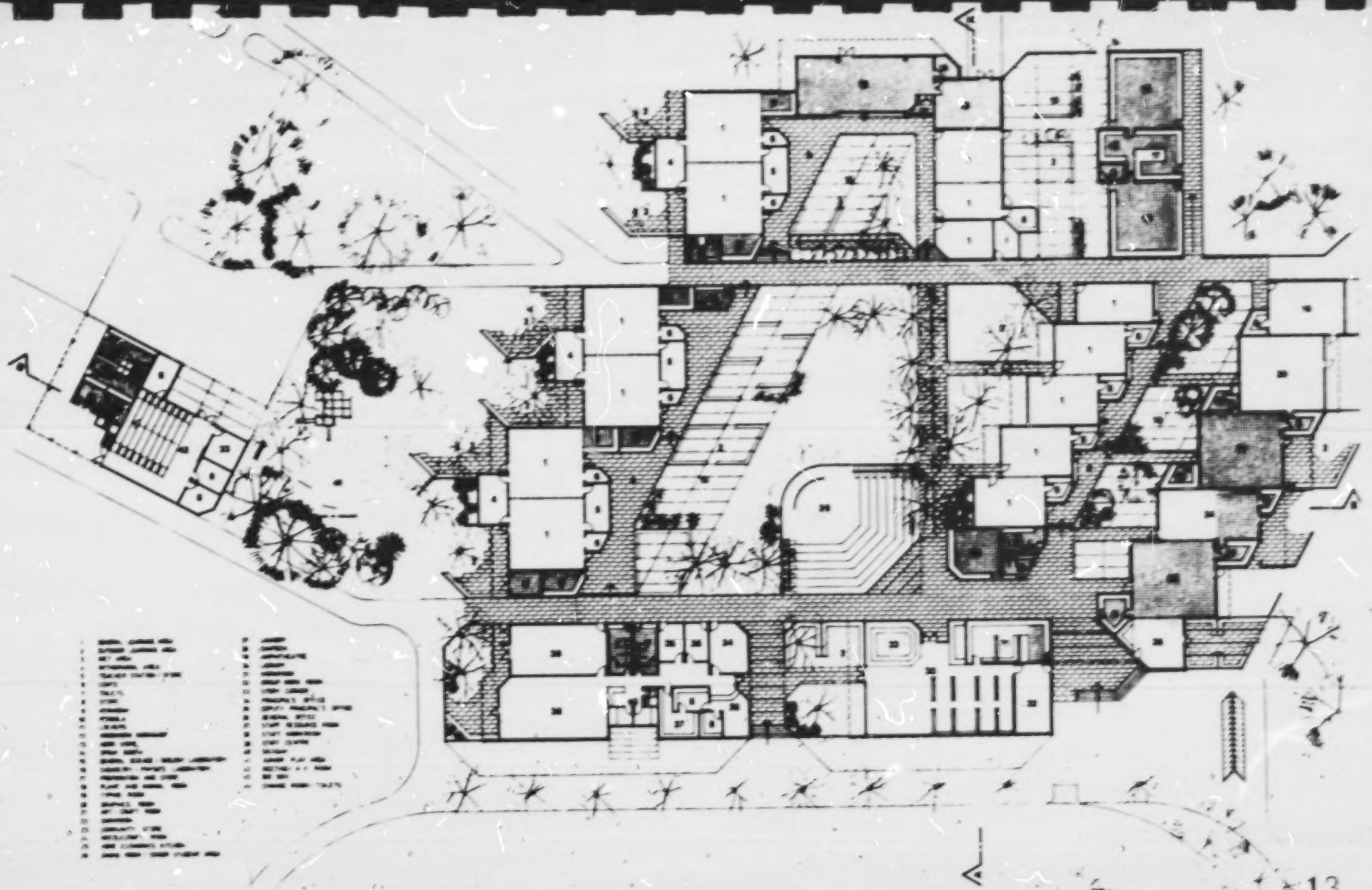
The new complex is located with a McKenzie Street address in the central area of the site. Main community-used facilities are directly accessible from the visitor's/staff car park. Facilities for the junior, middle and senior sections are each grouped together for identity and convenience.

6.2 Energy Conservation, Environmental and Landscape Planning

The design will minimise ongoing energy consumption costs whilst maintaining comfortable internal and external environmental conditions in an arid climate zone of the state. The school design has been extensively analysed and modelled using CSIRO and Melbourne University solar design computer programs and specialist energy engineering advice at all stages. It provides for energy savings by substantially reducing reliance on artificial lighting, heating, cooling and ventilation and allowing for future installation of solar space heating and solar air conditioning equipment. The design pioneers many of these principles for institutional buildings in this state and could be applicable as a model for many aspects of arid zone school design.

These design principles have dicated:

- orientation and location on the site
- general and detailed architectural form
- building materials
- the scope and principles of landscaping and siteworks design



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WYCHEPROOF EDUCATION CENTRE

FLOOR PLAN

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6.3 Staging

The possibility of a single stage of construction for the main educational buildings is currently being examined. The joint community Gymnasium and Squash Courts will be constructed at a later stage.

7.0 COST AND AREA ANALYSIS

Cost planning and unit cost and area analyses have been undertaken for the project.

The total project cost at September 1978 prices is estimated at $2,230,000, being $60,000 within the cost-adjusted project budget of $2,290,000.

1.0 INTRODUCTION

1.1 BACKGROUND

The Wycheproof Education Centre had its origins in the Wycheproof Higher Elementary School, dating back to the nineteenth century.

In the 1970s, after many years of spirited involvement by the local community, the school was augmented with the teaching of years 11 and 12 and was re-constituted as separate primary and high schools. The local community and school staffs saw a unique opportunity at this time to realise the full potential of thirteen year education in a small, closely-knit community by creating a single integrated school. The Wycheproof Education Centre was formed by the merger of the school councils into a single governing body and by the active development of academic and administrative structures to accommodate the P-12 school concept.

1.2 BASIS

In 1976, in the early stages of planning for new facilities, the school and community produced successively, two reports to guide future development. Firstly, the "Submission on the Proposed K-12 Building" formed an Educational Specification which set out the school philosophy, curriculum guidelines, organizational structure and community relationships. This report established the educational structure of the school made up of Junior, Middle and Senior sections. The second report, "Comments to the Architect", set down a physical facilities brief for the proposed centre.

1.3 PRESENT FEASIBILITY STUDY

Late in 1977 the firm of Sweetnam and Godfrey - Architects and Educational Planners - was engaged by the School Council to undertake the schematic design for a new school and, in addition, to advise the Education Department on the:

- Feasibility of re-use of existing buildings.
- Feasibility of provision of related community services.
- Rationalisation of current building criteria for primary and secondary schools.

2.0 THE WYCHEPROOF COMMUNITY

The Wycheproof township huddles between the Calder Highway and the lower slopes of Mt Wycheproof. It is a typical Mallee township, acting as the regional centre for a largely grain farming community. Because of this, it has a largely stable demographic character - income and population varying slightly year by year depending on the size of the local crops.

The total population of the shire has decreased by 12% since the 1961 census. However, the school age population has increased by 9% over that time. It seems reasonable to assume that population will remain static, or very slowly decline to a new static situation. Local sources indicate that despite small demographic changes within the shire, the population has remained virtually the same since the turn of the century. This applies particularly in the town itself.

The community has a strong cohesiveness and identity, working together to provide local facilities such as playing fields, or to raise money for local and international service projects. It works hard to make "Wyche" a special place for those who live there, and a well-known town throughout the State.

2.1 COMMUNITY MEETINGS AND ENTERTAINMENT

Most large community gatherings are held at the Shire Hall, seating 800 to 1000, or in the local wheatshed which accommodates 2000 people. Small groups meet at the Hotel, or more recently, at the school. There are no other community facilities suitable for groups from 50-200. After interviewing all local service, sporting and cultural groups, it appears that school facilities could provide valuable space for such groups to hold meetings, show films, hold tournaments, produce plays and musical entertainments on a small scale (up to 200).

2.2 SPORTING ACTIVITIES

There is a strong emphasis on sporting activities in the town and most people are involved in at least two sports. Winter football or netball in particular form an important part of the social interaction in the area. The school and shire already co-operate in joint construction, maintenance and use of most sporting facilities. A growing desire for local squash courts an indoor sports hall is apparent. At present the squash club drives 80km to St Arnaud to play.

Local sporting facilities include:-

Football oval with cricket pitch.
Hockey field.
Croquet and bowls lawns.
Swimming pool.
Tennis courts.
Basketball/netball courts.
Racecourse
Golf Course.

2.3 LIBRARY SERVICES

Wycheproof is at present visited fortnightly by a bookmobile from the Swan Hill Regional Library Service. With a capacity of 5000 volumes, this service gives readers a wide choice of titles but has the disadvantage of not being permanently available for reference. One third of the books borrowed are non-fiction and these should be more easily available to the community.

If an appropriate sized bookstock, say 1000 volumes, was integrated into the new school library, it could extend the collection to serve the whole community with a minimal addition of built space. These books would remain part of the Regional Library Service and would be rotated during school holidays. With co-operation between the school and shire in regard to staffing, the library hours could be extended beyond the school hours, encouraging parents and children from other schools to use the Centre's facilities, and be a continuing link for young adults after they leave school.

2.4 FACILITY REQUIREMENTS

The physical requirements of the above community activities which it would be desirable to accommodate as a part of, or in association with the new school facilities, are summarised below.

COMMUNITY GROUP	FACILITY REQUIRED
Arts Council	Art and craft exhibition space. Security requirements are low. Exhibitions would be of about three days duration. A foyer or a room adjacent to a main circulation route would be ideal.
	Small auditorium for solo performers with audiences of 100.

Drama Group	Rehearsal room for a range of performances each year with a cast of approximately 15 people. Storage would be required nearby for costumes and props.
	Once a year drama production with an audience of 200, for which the Shire Hall is grossly over-sized.
Music Group	Rehearsal room for the brass band of 25 players. An adjacent uniforms store is also required but not storage of instruments.
Scouts and Guides	Space for active games, films, listening to and performing music. Use of the Home Economics facilities.
Apex and Lions Clubs	Room for fortnightly directors meetings.
	Use of a moderately large space for games nights.
Basketball Club	Use would be made of an indoor basketball court with limited spectator space, if available.
	Training facilities desirable.
Football Club	Training facilities desirable.
Swimming	Training facilities desirable.

Squash	2 squash courts needed.
Swan Hill Regional Library	Shelving for approximately 1000 additional books integrated into the school library.

3.0 THE SCHOOL SITE AND CLIMATE

3.1 TOPOGRAPHY AND GEOLOGY

The site lies on the western slope of Mt Wycheproof with typical gradients of 1:15 to 1:10. The mountain is a small igneous intrusion in the wheat plains of the Southern Mallee. Rocky outcrops and loose boulders characterize the site, which is eroded on the exposed slopes and has only a thin unstable layer of top soil.

3.2 VEGETATION AND LANDSCAPE

The northern part of the site has been planted with Western Australian tree species and these seem to be surviving satisfactorily without attention. The remaining natural vegetation is sparse and fragile. Heavy usage has destroyed the ground cover over large areas, and the site is in need of a thorough rehabilitation and planting scheme.

The immediate grounds of the permanent school buildings in the south-western part of the site, on the Mount Street frontage, have been landscaped with simple lawns, flower-beds and some exotic trees whilst the grounds of the secondary school re-locatable facilities are largely bare earth with no planting and little or no paving, drainage or other site works. On the north-western area of the site, extending over the site boundary into the grounds of the adjacent Scout Hall, is a relatively extensive levelled and grassed sports ground, constructed by the local community.

3.3 CLIMATE AND MICRO-CLIMATE

The continental climate results in a wide diurnal temperature range with few days of rain. The average temperature range in February is 21°C (9 a.m.) to 29°C (3 p.m.) (min 18° max 31°) and in July is 6°C (9 a.m.) to 13°C (3 p.m.), (min 3° max 15°). Clear skies are common, with characteristically rapid solar gain and evening heat loss. This particularly accentuates the diurnal range on mid-season days when chill mornings are followed by noticably warm afternoons and cold nights. Rainfall averages some 370mm per year with marked annual variability.

The site is very exposed to the hot and dusty northerly to north westerly winds in the warm months, whilst exposure to westerlies is a problem at all times of the year.

The area is climatically most suitable for outdoor classes in areas sheltered from the hot summer winds and dust, and such learning spaces have been considered an important element in the design of the complex.

3.4 BUILDINGS

The existing original school buildings date from the last century and face Mount Street on the southern part of the site. The secondary school is largely located in portable classrooms adjacent to the permanent buildings. The condition and suitability of these structures for educational use are discussed in Section 5 of this report.

A part of the southern site boundary is occupied by an Education Department staff residence.

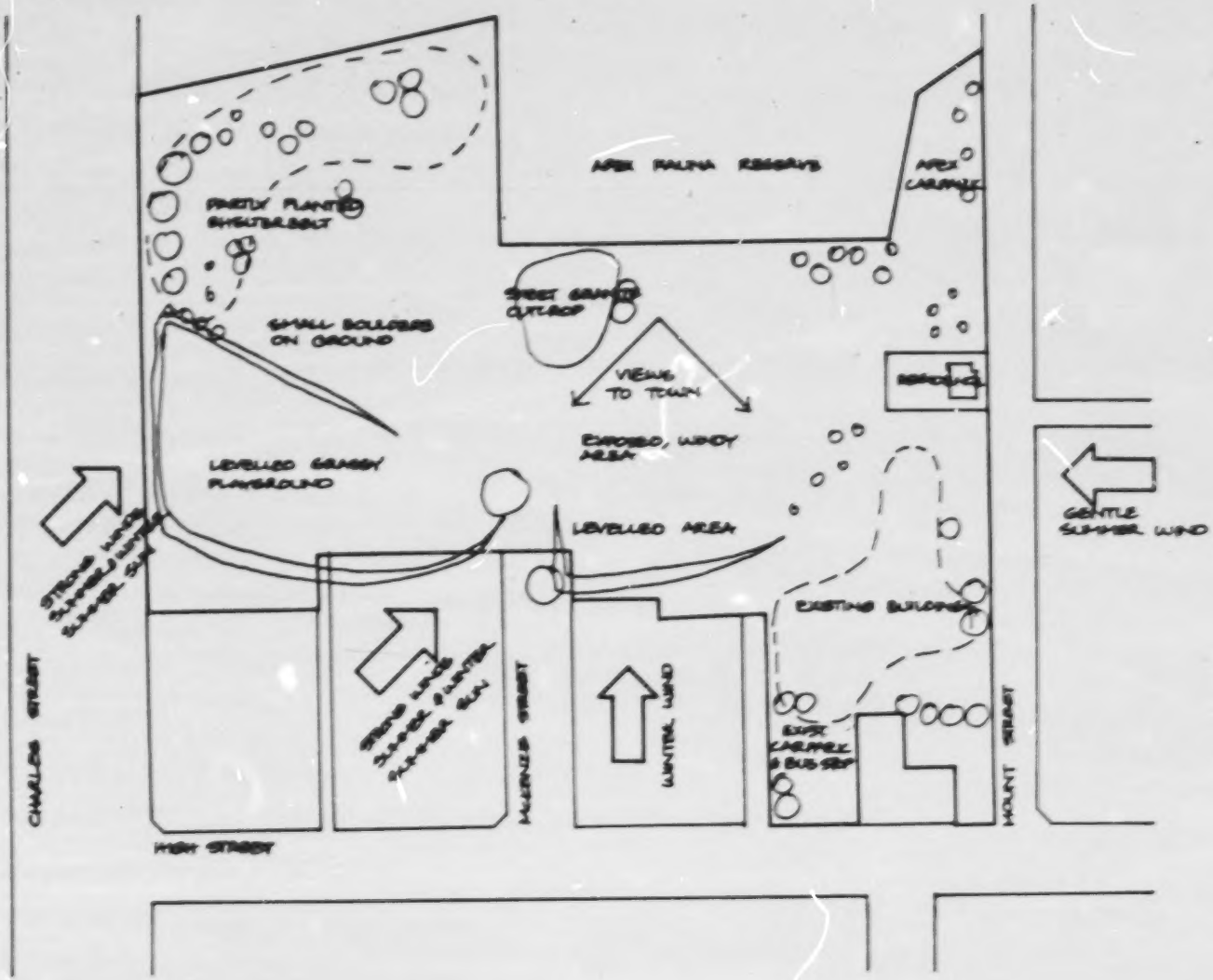
3.5 ACCESS AND VEHICLES

Approximately half the students live in the town, and half are bussed from the surrounding farms. Student arrivals at the school are by bus (45%), foot (37%), bicycle (11%) and car (6%). Currently 65% of student arrivals, including all bus arrivals, are at the High Street frontage and 34% at Mount Street. There is no reason to suppose that these patterns will significantly change with time.

There are five buses servicing the school. Approximately 40 students ride bicycles.

Staff car parking varies from 10 to 20 at the maximum. Community parking is minimal with existing school facilities. There is no special provision for delivery access.

Bus and car drop-off, staff and community carparking and deliveries have been considerations in siting the new complex so that pedestrian/vehicular conflict is avoided.


APEX PALMA RESERVE
APEX CARPARK
PARTLY PLANTED SHELTERBELT
SMALL BOULDERS ON GROUND
STREET GRANITE OUTCROP
VIEWS TO TOWN
EXPOSED, WINDY AREA
LEVELLED GRASSY PLAYGROUND
LEVELLED AREA
GENTLE SUMMER WIND
EXISTING BUILDINGS
EXIST CARPARK & BUS STOP
WINTER WIND
CHARLES STREET
MERVIS STREET
MOUNT STREET
HIGH STREET

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4.0 EXISTING BUILDINGS

4.1 INVENTORY OF EXISTING BUILDINGS

The accompanying site plan shows and identifies the existing buildings listed in the following inventory.

Building Type	Nett Area (approx)	Present Use
A Permanent-Weatherboard	$395m^2$	Primary/Secondary
B Permanent Weatherboard	$60m^2$	Primary
C Permanent Weatherboard	$40m^2$	Secondary
D Permanent Weatherboard	-	Shelter Shed
Sub total Permanent Building	$495m^2$	
E Temporary LTC	$140m^2$	Primary
F Temporary LTC	$140m^2$	Secondary
Sub-total Temporary Buildings	$280m^2$	

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EXISTING BUILDINGS 19

G	Metal-clad Re-locatable	$55m^2$	Secondary
H	Terrapin Re-locatable	$75m^2$	Staff/Admin
I	LTC Re-locatable	$55m^2$	Staff/Admin
J	Atco Re-locatable	$85m^2$	Secondary
K	Atco Re-locatable	$85m^2$	Secondary
L	LTC Re-locatable	$55m^2$	Secondary
M	Re-locatable	$85m^2$	Secondary
N	LTC Re-locatable	$45m^2$	Secondary
O	LTC Re-locatable	$55m^2$	Secondary
P	LTC Re-locatable	$51m^2$	Secondary
Q	Re-locatable	-	Toilet
R	Re-locatable	-	Toilet
	Sub-total Re-locatables	$650m^2$	

Total Existing Nett Floor Area $1425m^2$

4.2 STUDY OF THE RE-USE OF EXISTING BUILDINGS

Of the existing buildings listed, the original Higher Elementary School main building (A) and the two Temporary LTC Buildings (E and F) have been studied to determine their suitability for re-use as part of the new school complex.

Suitability for re-use was examined under the following headings:

4.2.1. Structural Suitability

The original main school building was inspected by the PWD Structural Engineering Group late in 1977 and found to be quite satisfactory, subject to some structural renovation works.

Rankine and Hill, Consulting Engineers, inspected the three buildings on 2 March 1978 and generally endorsed that report, subject to the possibility of some strengthening of the floors of the LTC buildings if used for woodwork or similar activities. Special concrete machine bases may be required to reduce noise and vibration from woodwork machinery.

4.2.2 Location

The existing location of the buildings does not suit the rationale adopted for the new building complex, of a central site location on land elevated above the Mount Street entrance. This applies particularly to the LTC building (F). If the existing location is to be retained, the buildings would be suited only to rooms relatively weakly linked to the remainder of the complex in terms of utilisation and affinity. Such rooms might also be those best able to benefit from community access from Mount Street.

Art/Craft/Graphics and Woodwork appear to be the only potentially suitable functions in this category. However, such a location would split the focus of the school's community address and access, which is principally related to existing town sporting activities to the north of the site.

4.2.3 Mobility

Rankine and Hill have also inspected the buildings with a view to their possible re-location on the site.

The two LTC buildings were built as temporary facilities and are very lightly framed. Whilst they could be moved, they would have to be cut into sections, strengthened and re-assembled to avoid serious deterioration. This operation is possibly only at a high cost of making good the re-located buildings and does not seem warranted for temporary structures which already show signs of completing their useful life.

The original main school building is of more substantial construction, with probably a longer life, however its re-location could be achieved only by similarly sectioning the structure and re-assembling it at a high cost.

Cameron and Middleton, Building Economists, have indicated that the renovation costs of buildings relocated by these means could amout to some 2/3 of the cost of new buildings.

4.2.4 Functional Suitability

Due to its location alone, the LTC building (F) is not functionally suited to re-use in the new complex.

Art/Craft/Graphics and Woodwork could be located in this general area of the site. However, the original main school building by itself is not suitable to accommodate all of these functions without major structural modifications and some additions. Art/Craft/Graphics alone would only utilize some two thirds of this building.

The eastern LTC building (E) could accommodate Woodwork with a considerable degree of internal renovation.

4.2.5 Life-long and Capital Cost Comparison

Cameron and Middleton have conducted a comparative study of the life-long costs and the capital costs of new Art/Craft/Graphics and Woodwork facilities on the one hand and renovated facilities on the other.

In life-long costs over 40 years, capitalised to present value, the study shows a cost advantage for renovation of existing buildings between $30,000* and $40,000. Capital costs show a cost advantage of $89,000 for the existing buildings.

These cost differences are approaching the marginal in an overall project budget of $2,230,000. This marginal advantage could well be eliminated when questions of air conditioning capital and running costs are taken into account.

4.2.6 Conclusion

At his visit to the school on 10 March 1978 the Minister advised the School Council that he would agree to the re-siting of the new school and the vacating of the existing buildings. In the light of this advice, and the foregoing study, it was agreed not to re-use these buildings.

*all figures base dated to September 1978

5.0 RATIONALISATION OF THIRTEEN YEAR FACILITY STANDARDS

The thirteen year approach to education would be of little meaning if standard departmental primary and high schools were simply constructed side by side. The P-12 concept not only implies combined and rationalised library and staff centre and access to facilities not otherwise available, but permits educational innovation at the curriculum organisational and staffing levels. All of these factors in turn, can have facility implications for the new school.

At Wychaproof a major innovation has been the re-organisation of the school into junior (P-4), middle (5-8) and senior (9-12) educational sections. This has had significant physical effects, but also has neccessitated a review of enrolment patterns sub-divided into these three groupings rather than into primary and secondary.

5.1 ENROLMENT PATTERNS

As elsewhere mentioned, the Wycheproof catchment area has been largely demographically stable throughout this century. Since 1961 there has been a slow decline in total population but a 9% increase in the school-age sector.

5.1.1 **Past Enrolments**

Recent past enrolments are tabulated below:

Year	71	72	73	74	75	76	77	78
P	22	26	28	29	17	32	23	28
1	25	22	25	27	30	19	33	22
2	14	25	22	26	28	29	17	31
3	25	13	24	21	26	26	27	19
4	26	23	12	25	25	27	29	27
Sub Total	112	109	111	128	126	133	127	127
5	23	23	22	12	24	28	25	26
6	20	22	25	23	18	26	28	26
7	18	30	38	32	28	35	44	41
8	29	25	23	37	29	40	33	43
Sub Total	90	100	108	104	99	129	130	136
9	23	28	32	32	43	39	35	30
10	19	21	26	29	26	38	32	29
11	10	8	11	12	11	20	29	23
12	-	-	-	1	2	7	10	9
Sub Total	52	57	69	74	82	104	106	91
Total	254	266	288	306	307	366	363	354

5.1.2 Enrolment Projections

Enrolment Projections for the primary years have proven very accurate in the past whilst there are uncertainties in the pattern for the secondary area. For this reason the parameters of variability have been studied and estimates of minimum and maximum enrolment projections have been completed until 1985.

Enrolment projections indicate that the Wycheproof Education Centre would mostly have a total enrolment of between some 350 to 375 students. The junior school would generally have enrolments of around 120, the middle school between a low of 125 and a high of 131, and the senior school between a low of 107 and a high of 123.

Minimum projections:

Year	79	80	81	82	83	84	85	
P	21	23	23	24	24	24	24	
1	28	21	23	23	24	24	24	
2	22	28	21	23	23	24	24	
3	31	22	28	21	23	23	24	
4	19	31	22	28	21	23	23	
Sub Total	121	125	117	119	115	118	119	Average 121
5	27	19	31	22	28	21	23	
6	26	27	19	31	22	28	21	
7	35	35	39	29	42	38	38	
8	41	35	35	39	29	42	38	
Sub Total	129	116	124	121	121	129	120	Average 125

9	43	41	35	35	39	29	42	
10	28	41	39	33	33	37	27	
11	23	22	35	33	27	27	31	
12	8	8	7	12	11	9	9	
Sub Total	102	112	116	113	110	102	109	Average 107
Total	352	353	357	353	346	349	348	Average 353

Maximum projections:

Year	79	80	81	82	83	84	85	
P	21	23	23	24	24	24	24	
1	28	21	23	23	24	24	24	
2	22	28	21	23	23	24	24	
3	31	22	28	21	23	23	24	
4	19	31	22	28	21	23	23	
Sub Total	121	125	117	119	115	118	119	Average 121
5	27	19	31	22	28	21	23	
6	26	27	19	31	22	28	21	
7	39	40	44	33	47	41	41	
8	41	39	40	44	33	47	41	
Sub Total	133	125	134	130	130	137	126	Average 131

9	43	41	39	40	44	33	47	
10	30	43	41	39	40	44	33	
11	26	27	40	38	36	37	41	
12	11	13	13	20	19	18	18	
Sub Total	110	124	133	137	139	132	139	Average 123
Total	364	374	384	386	384	387	384	Average 375

5.2 CURRICULUM

5.2.1 General Description

The fundamental educational philosophy of the Wycheproof Education Centre is that it will offer a wide range of subjects to its students so that each student may have every chance of meeting his or her particular educational and vocational objectives at secondary and post-school levels. This will be particularly true for those students intending to go on to tertiary education.

The junior section of the school is most closely comparable with conventional school structure, organisation and facilities. It will operate as a somewhat autonomous unit whilst making use of the library, the meeting/audio-visual room and the gymnasium for drama, music, television, film and physical education. Activities in the general learning areas occupy about 80% of the school week. The five years will be grouped into four composite classes.

The middle school is transitional in nature with years 5 and 6 having some experience of activities in specific learning areas: especially Art, Needlecraft and Woodwork. During the Years 7 and 8, students follow a common course of a wide range of subjects. Home Economics and Woodwork are mandatory for both boys and girls. A degree of home room identity is considered desirable for the bulk of the week in these two years.

A choice of elective subjects which commences in Year 9, becomes wider as the student progresses through the consecutive years. The consequence of offering a very wide elective programme is that for a relatively small school such as this there will be a tendency towards small subject groups in the elective area. However, even if very few students wish to take a particular subject the school will make every effort to accommodate these students. Taking correspondence courses as an alternative is believed to be unsatisfactory.

Some of the elective subjects offered in Years 10 and 11 are in fact taken at the Charlton Technical Complex which has new and well appointed facilities. Utilisation of the Charlton facilities has proven successful from both an educational and social point of view and the Wycheproof Education Centre intends to continue this arrangement in the ensuing years. Rationalisation of the facilities to be provided in the new complex for Wycheproof will therefore take this arrangement into consideration to avoid unnecessary duplication.

Subjects offered at Charlton include:

- Automative Practice
- Agricultural Practice
- Metal Practice
- Building Practice
- Business Studies. A choice of (a) Typing and Bookkeeping
  or (b) Typing and Shorthand
- Garment Construction
- General Graphics combining Engineering Graphics and Building Graphics

5.2.2 Periods Generated by the Curriculum

Assumptions:

1 The 1977 enrolment figures were used for the analysis. Total figures for this year were 363 students which is approximately the mean of the maximum and minimum enrolment projections of 375 and 353 respectively.

2 Enrolment levels higher than the projected mean or even the projected maximum, would not tend to generate more periods per week. The main consequence will be that individual subject groups will be larger.

3 The curriculum at secondary level has, over recent years, been refined to a reasonably fixed state but will also allow considerable flexibility to its students through the wide range of electives it offers. It is considered that this basic curriculum structure will serve the school for many years into the future and has therefore been adopted as the basis for determining facility requirements.

The following table outlines the aggregate periods per week generated by each year. Those subjects which would clearly use general learning type facilities have been grouped together. Some of these subjects such as Mathematics, Geography and Language Studies, which either generate sufficient periods per week to justify their own particular facility or could have special equipment or furniture requirements, may in fact be given that separate status from time to time by the school, as is convenient.

Periods per week (1 period = 45 minutes)

Year	General Learning Activities *	Drama	Music	Television	Film	Typing	Home Economics	Science/Biol/ Chem/Physics	Needlecraft	Woodwork	Art	Graphics	Physical Education	Sport
P	22	3	2	4	1								1	
1	27	1	2	1	1								1	
2	28	1	1	1	1								1	
3	28	1	1	1	1								1	
4	28	1	1	1	1								1	
Sub-Total	133	7	7	8	5	-	-	-	-	-	-	-	5	-
5	27	1	1	1	1				o	o	o		2	
6	26	1	1	3	1				o	o	o		1	
7	47	+	+				6	6	6	6	4	4	2	2
8	36	+	+				6	6	6	6	4	4	2	2
Sub-Total	136	2	2	4	2	-	12	12	12	12	8	8	7	2
9	39	+	+			4	6	4	3	3	4	3	2	2
10	40	+	+			6	6	6	3		6	3		2
11	59	+	+			5	5	17	5		4	5		2
12	66	+	+				6	18			6	6		
Sub-Total	204	-	-	-	-	15	23	45	11	3	20	17	2	2
Total	473	9	9	12	7	15	35	57	23	15	28	25	14	2
Grand Total	724 periods per week													

* Includes English, Social Studies, Economics, Consumer Education, History, Geography, Language Studies and Maths.

\+ Depends on teaching staff available. If so, compensation is made in other subjects.

o Irregular familiarisation of specialist facilities.

5.3 FACILITIES GENERATED

The most singular characteristic of the analysis of time tabled facilities was the demand for a large number of both specific and general learning areas in the secondary school sector. The large number is necessary to accommodate a full secondary curriculum. However, because of the small school enrolment, standard room sizes are not needed beyond the primary school. In total, the number of student seats generated in teaching rooms is, however, less than that in the original EFRL brief for the school.

5.3.1 Number of Learning Areas Required

For years P to 6, the curriculum and enrolments warrant six standard primary general learning areas with associated ancillary facilities. In addition, a multi-purpose facility is needed for Drama, Music, Television and Film. Primary students attend the equivalent of 30 periods per week.

Years 7 to 12 are more complex. The secondary time tabling capacity for rooms is 35 periods per week less 2 periods of sport and 1 period for the staff weekly meeting. Thus 32 periods per week are available for timetabling years 7 to 11 and 34 periods for year 12.

From the preceeding table in Section 5.2, there are 287 periods per week requiring general learning areas for years 7 to 12. The remaining subject groups (9 in number) will require a specific space-type for their operation regardless of the number of periods per week they handle. A number of alternatives were considered for rationalising the distribution of periods per week generated by the curriculum and the number of space types required and the following conclusions reached:

	Primary General Learning	Secondary General Learning	Drama/Music/TV/Film	Typing	Home Economics	Science/Biol/Chem/Physics	Needlecraft	Woodwork	Art/Craft	Graphics	Physical Education	
Periods per week	186	287	37	15	35	57	23	15	28	25	14	722
Fractional number of rooms required based on 32 ppw (years 7-12) & 30 ppw (years P-6)	6.20	8.97	1.23	0.47	1.09	1.78	0.72	0.47	0.88	0.78	0.44	23.03
Rounded number of rooms required, based on above	6*	9	1*	1	1+	2	1	1	1	1	1°	25
Percentage time utilization	100%	100%	100%	47%	100%	89%	72%	47%	88%	78%	44%	92%

* Primary rooms can achieve effective utilization higher than 100% due to composite grades.

+ The Home Economics room can take multiple groups in years 11 and 12 and thus achieve marginally above 100% utilization.

o Physical Education can be taken outdoors or in the joint community Gymnasium in a later stage.

5.3.2 Group Sizes to be Accommodated

From the maximum enrolment projections, a typical maximal series of year enrolments was selected for analysis of the room sizes required.

Year	Enrolment
P	26
1	26
2	26
3	26
4	26
5	26
6	26
7	41
8	41
9	41
10	41
11	38
12	18
Total	402

Department of Education regulation is that for years 7 to 10 Staff Ratio is 1.35 students. For years 11-12 Staff Ratio is 1:30 students.

VSTA adopt a ratio for years 7-10 of 1:30 students.
For years 11-12 of 1:25 students.

The general rule is that for years 7-10, once over 35 students, the year can be split into two groups: for years 11-12, once over 30 students, the year can be split into two groups.

In a small school such as the Wycheproof Education Centre the school must be staffed for certain subjects (such as Home Economics, Woodwork, Art, Physics, Bio/Chem) regardless of staff/student ratios. The present (and intended future) staff establishment of 22-23 staff members is sufficient therefore to cope with

the splitting of years according to the VSTA recommendations.

It therefore appears that, based on minimum enrolment projections, years 7-10 will always tend to be split into at least two groups, and in some cases three groups (eg English and Mathematics subjects where a remedial group is usually necessary). Years 11 and 12 will tend to break down into very small groups for elective subjects and two groups for the core subject, English.

Specific learning areas:

Following the above argument through, and looking at the maximum enrolment group sizes, it appears that no specialised room will need to be designed to accommodate more than 24 students. The rooms for Home Economics, Woodwork and Craft will rarely need to accommodate more than 14 students at any one time, because year sizes for these subjects are to be split into three groups.

General Learning Areas:

From the previous argument it also appears that no general learning rooms will need to accommodate more than 24 students. However, because of the range of electives offered in the curriculum there will be some general learning areas which should be designed to accommodate less than 24 students.

The current elective choices for grades 10, 11 and 12 were used as a reasonable basis for determining the range of group sizes in the general learning elective area which the curriculum generates. These sizes were then modified on a pro rata basis for the projected maximum grade sizes.

A wide range of room sizes for secondary areas, was examined in a series of analyses, with the following results:

Year 7	1 x 24 seat GLA (also partially used by Year 8)
Year 8	1 x 18 seat GLA (also partially used by Year 7)
Years 7 & 8	1 x 12 seat GLA (also partially used by the senior section)
Years 9-12	2 x 24 seat GLA s
	1 x 18 seat GLA
	1 x 6 seat GLA

5.4 FACILITIES BRIEF SUMMARY

The detailed brief of facilities for the project was derived from the above rationalisation process for timetabled rooms and also incorporates requirements for joint school facilities and community facilities.

The principal non-timetabled joint facilities, which involve rationalisation and some economy of floor space compared with the simple addition of primary and secondary guidelines, are the Staff Centre/Administration, the Library and the Canteen.

All facility needs have been developed in association with the staff and the School Council. The full loose-leafed brief document was forwarded to Facilities Planning Branch in January 1978.

SUMMARY OF FACILITIES

Space Number	Space Name	Nett Area m^2
100	General Learning Areas	
101 - 104	Junior School GLAS - 4 areas at $105m^2$	420
105 - 109	Middle School GLAS	
	Years 5 & 6 2 areas at $105m^2$	210
	Years 7 & 8 1 room at $48m^2$	48
	1 room at $36m^2$	36
	1 room at $24m^2$	24
110 - 115	Senior School GLAS	
	4 rooms at $48m^2$	192
	1 room at $36m^2$	36
	1 room at $12m^2$	12
		978
200	Specialist rooms	
201	Typing	54
202	General Science/Biology	67
203	Chem/Physics	67
204	Home Economics	126
205	Graphics	86
206	Art/Craft	86
207	Needlecraft	70
208	Woodwork	100
		656

SUMMARY OF FACILITIES (continued)

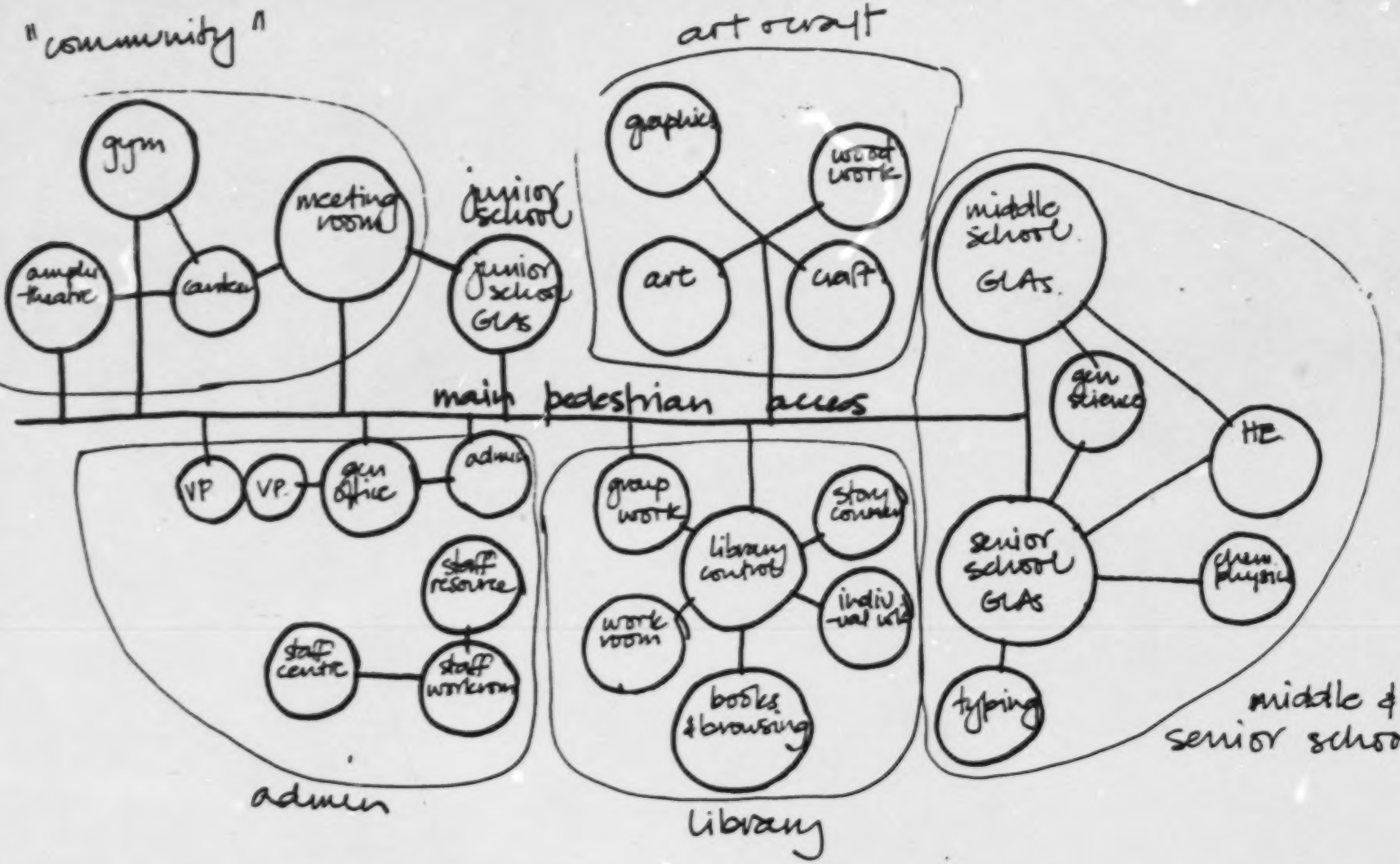
		Nett Area m^2
300	Library	
301	Catalogue/control	9
302	Bookstacks & browsing	66
303	Individual work	63
304	Group work	30
305	Story corner	35
306	Workroom/AV	50
		253
400	Administration & Staff Centre	
401	Principal's office	23
402-403	Deputy principal's offices	30
404	General Office	16
405	Staff resource centre	15
406	Staff workroom $5m^2$/staff	100
407	Staff centre	70
408	Sickbay Suite	16
		270
500	Miscellaneous	
501	Meeting/Audio-visual room	100
502	Canteen	40
503	Amphitheatre	-
504	Gymnasium	540
505-506	Squash courts	125
		805

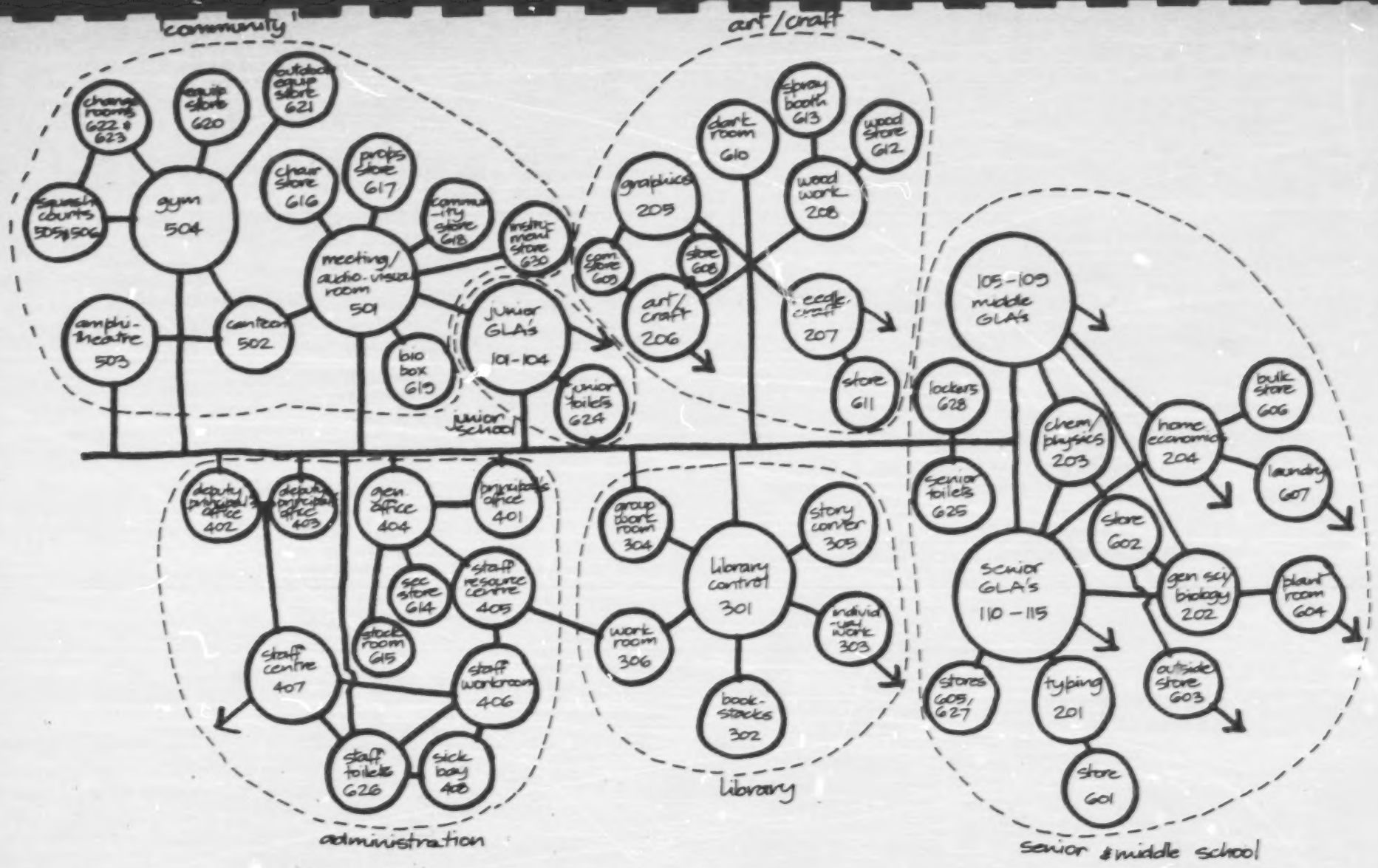
SUMMARY OF FACILITIES (continued)

		Nett Area m^2
600	**Ancilliary spaces**	
601	Typing store	10
602	Science store and preparation room	40
603	Outside science store	6
604	Plant and animal room	- (inc in 602)
605	Social studies store	8
606	Home Economics bulk store	10
607	Laundry	10
608	Art store	12
609	Community store (Art)	12
610	Darkroom	10
611	Craft store	12
612	Woodstore and machine shop	50
613	Spray booth	6
614	Security store	8
615	Stockroom	16
616	Chair store	10
617	Props store	10
618	Community store	12
619	Bio box	8
620	Equipment store	30
621	Outdoor equipment store	15
622	Male shower/change	50
623	Female shower/change	50
624	Student toilets - junior	-
625	Student toilets - senior	-
626	Staff toilets	-
627	Maths store	10
628	Lockers	-
629	Shelter areas	-
630	Instrument store	15
		420

SUMMARY OF FACILITIES

Summary		Nett Area m^2
100	General learning areas	978
200	Specialist spaces	656
300	Library	253
400	Administration	270
500	Miscellaneous	805
600	Ancilliary spaces	420
		3382


"community"
art craft
gym
meeting room
junior school
graphics
wood work
art
craft
middle school GLAs
amphi theatre
canteen
junior school GLAs
main pedestrian access
gen science
HE
VP
VP
gen office
admin
group work
library control
story corner
senior school GLAs
drama physics
staff resource
individual work
work room
staff centre
staff workroom
books & browsing
typing
middle & senior schools
admin
library



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TOTAL RELATIONSHIP DIAGRAM

6.0 SCHEMATICS PROPOSAL

6.1 SITE ZONING

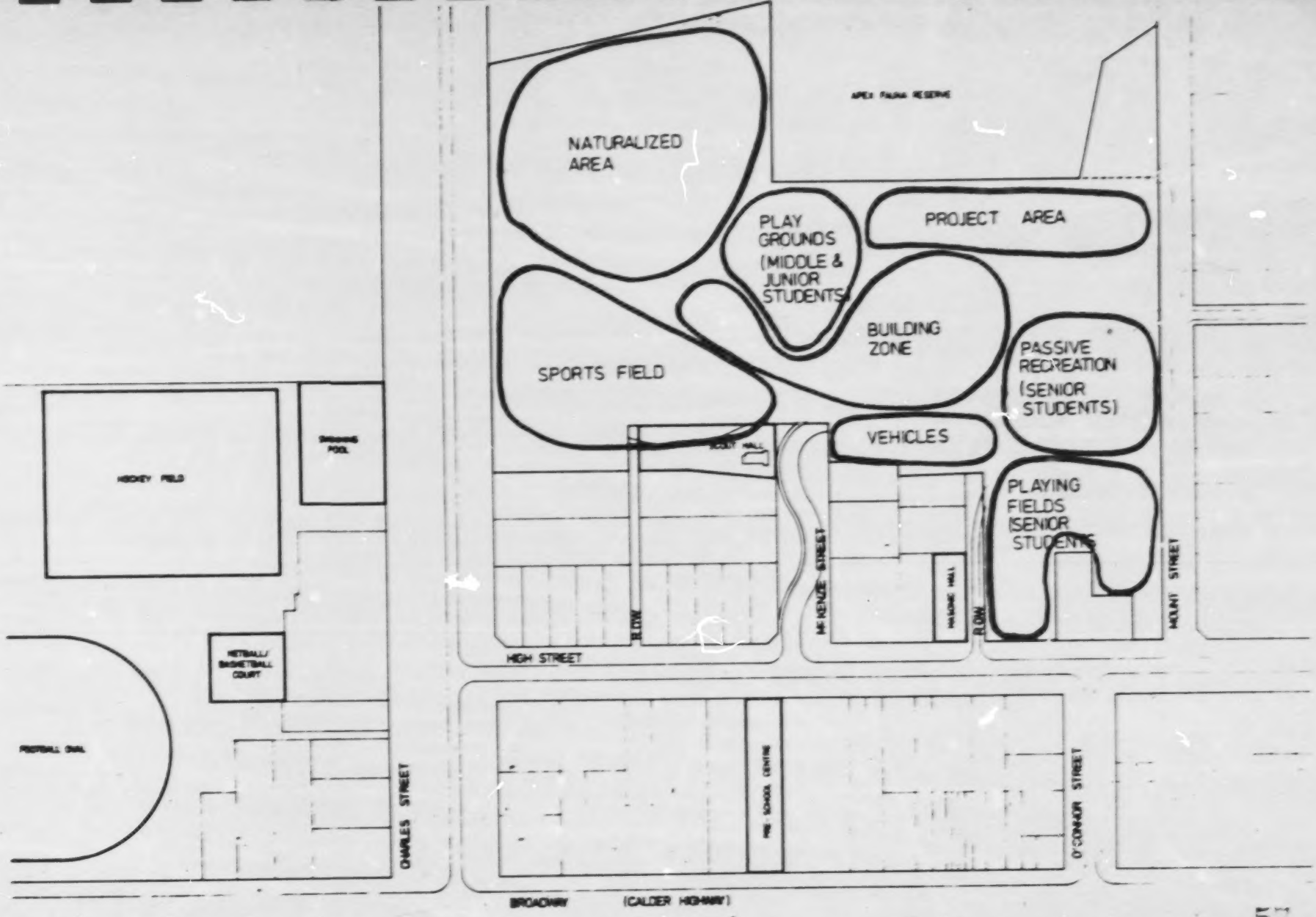
The school's educational specification - "Submission on Proposed K-12 Building" - states the school community and staff's preference for the re-location of the complex to the central area of the school site. Since then the School Council has strongly supported this view that the school buildings should be centrally located with the main address and entry from McKenzie Street. There are a number of reasons in favour of re-location:

6.1.1 Access and Pedestrian/Vehicular Safety.

Currently 66% of students arrive at and depart from the western and northern approaches to the site. In addition, the area around the existing Mount Street entrance is a relatively busy street, unsafe for vehicle drop-off of students. A McKenzie Street address will facilitate a safe and convenient one way traffic system for buses, cars and deliveries.

6.1.2 Supervision.

Due to the site topography, the existing school location is visually separated from the bulk of the site and offers very poor supervision of student outdoor activities. The proposed central location would allow much easier surveillance of the whole site and its approaches.



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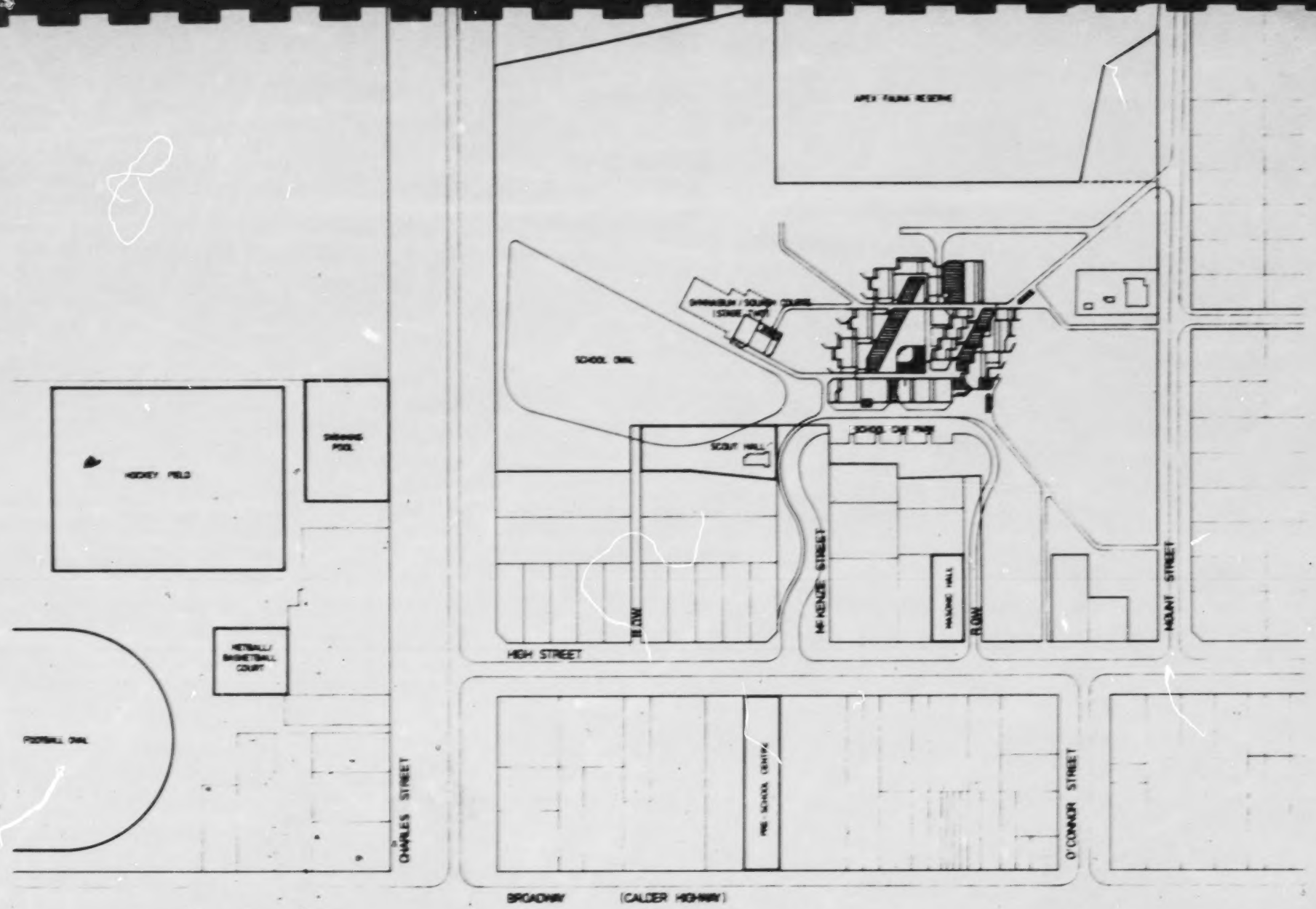
SITE ZONING 44



WYCHEPROOF EDUCATION CENTRE

LOCALITY PLAN

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6.1.3 Community Sporting Relationship

A close degree of interaction is envisaged - in both directions - between the school and community use of respective sporting facilities. The proposed building location brings the complex within view and pedestrian access of the town sporting area and will facilitate a wider range of desired community use.

6.1.4 Micro-climatic Improvements and Energy Conservation

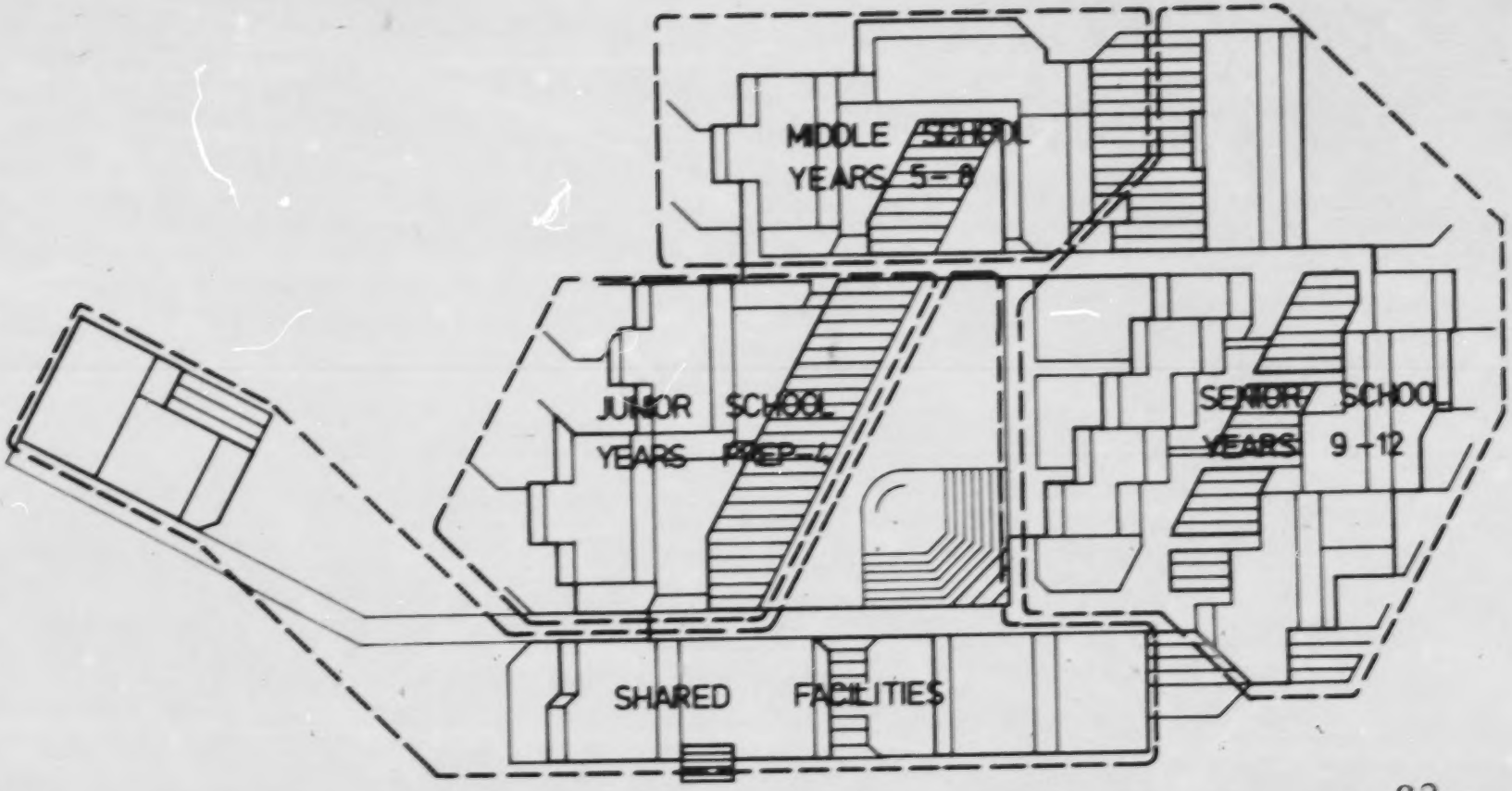
The whole school site is currently exposed to hot and dust laden winds and only by developing a substantial buffer zone of specifically designed shelter belts of mounds, trees and screen walls around a centrally located building complex, can these effects be ameliorated. The establishment of a calm, cooler air mass around the building perimeters can reduce cooling loads substantially in hot weather.

6.1.5 Outdoor Learning and Recreation Areas

Re-location facilitates the development of age and function-differentiated outdoor spaces adjacent to particular rooms or sections of the school.

At the school meeting on 10 March this year, the Minister endorsed the School Council's view regarding the location of the complex and the associated abandonment of the existing permanent buildings for educational purposes.

The Site Zoning Diagram illustrates the broad allocation of site zones associated with the proposed building complex, as reflected in the detailed Site Plan.



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SCHOOL ZONING

6.2 ZONING OF THE BUILDING COMPLEX

The building complex presents its main community-accessed areas to the township: the gymnasium/squash courts, meeting/audio-visual room, school administration, amphitheatre, canteen and library. These facilities are directly accessible from the visitors' and staff car park which is located at a lower level and screened from adjacent residences by a windbreak mound.

A major innovation in the educational structure of the school is the sub-division of the thirteen year program into junior, middle and senior sections which, amongst other attributes can give students a progressive sense of advancement and achievement throughout their school life. To facilitate this, junior, middle and senior rooms have been grouped; giving identity, convenience and an individual gathering place. The junior school is close to sheltered playgrounds and the meeting/audio-visual room, the middle school to the project area and adventure playground, and the senior school to the library and outdoor passive recreation areas.

Physical Education and sporting facilities are adjacent to the existing playing field and in the closest proximity to the town sports area.

Rooms which need vehicular access have been located so that this access will not conflict with natural playing areas.

6.3 ENERGY PLANNING AND ENVIRONMENTAL CONCEPTS

As the project is located in the hot, arid region of the state, an early decision was made to utilize Micro-climate design and passive solar engineering principles so as to moderate the ongoing energy demands of cooling, heating and lighting. To assist in this work, Rankine and Hill, consulting engineers, were engaged as energy design engineers and the services of the Melbourne University Architecture School and CSIRO were also enlisted.

Exhaustive analysis of the thermal performance of various building design configurations was carried out with the assistance of the CSIRO TEMPER computer based system and the Melbourne University TEMPAL system. Only a brief summary of the material studied and the outcome in architectural terms can be incorporated in the space available in this report but it seems possible that the results could have general applicability to energy conservation in arid zone school design.

6.3.1 Solar Orientation

All learning areas are oriented in a northerly direction, with a north-easterly aspect, to make the best use of sunlight for early morning space heating in winter and mid-seasons and also to provide pleasant outdoor learning areas to the north of teaching rooms. Glazing and shading design has been determined by computer analysis to provide maximum control of sunlight for heating and cooling.

On the southerly side of the main teaching blocks, circulation has been provided under deep verandahs with associated pergola areas planted with deciduous vines. A variation of these principles has been applied to the specialised learning areas. The shaded areas provide a body of calm cooler air adjacent to all rooms to assist the cooling load of air conditioning equipment and to provide comfortable outside learning areas during hot weather.

6.3.2. Thermal Envelope

A range of conventional and exotic construction envelopes were examined by computer to determine the optimum performance under these conditions, and foil insulated conventional brick veneer construction was selected, with

carpetted slab-on-ground floors and foam/foil insulated metal deck roof construction. Further examination of possible double-glazing of roof lights is required at a later stage. North-facing glass will be insulated by open-weave woollen curtains to minimise heat loss in winter and glare in summer.

The intelligent use of natural ventilation will reduce energy consumption by allowing the mechanical plant to be shut off in mild weather. Openable windows should be installed, as a wider range of indoor temperatures may become acceptable when energy costs are higher in the future. Thus the season during which natural ventilation alone would be used would be extended.

6.3.3 Natural Lighting

Some 40% to 50% of institutional energy requirements can typically be consumed by artificial illumination. In addition, summer cooling loads are significantly increased by waste heat from light fittings. Daylighting is a powerful way of using passive solar design to reduce energy demands. For this reason, deep south facing rooflights have been provided over most rooms to provide, in association with the north facing glazing, a high standard of natural glare-free illumination throughout most of the year. Although there are winter heat losses through the roof lights particularly, this energy cost is repaid by cooling and lighting load savings.

6.3.4 Integrated Landscaping

As described in Section 6.4 following, and alluded to above, the landscaping design is critical to the energy performance of the building complex.

Generally across the site, mounding and shelter belts will lift prevailing winds and turbulence and reduce wind velocities around the buildings. Particular attention has been paid to funnelling effects between buildings. These factors are important for heating in cold periods, but critical for the moderation of cooling loads in summer.

North facing outdoor learning areas are planted with deciduous shade trees to admit winter sun, and shade the paving, seats, and adjacent buildings in summer.

Similarly the pergola areas are to be planted with deciduous vines and creepers to provide dense summer shade on the cool side of the buildings. The immediate periphery of the complex, and particularly the central courtyard areas require irrigation for the establishment of plants with large leaf surface and high transpiration rates so as to cool the enclosed air mass by humidification. A pool or fountain would also assist this objective if water resources permit.

6.3.5 Mechanical Heating and Cooling

Mechanical space heating and cooling will be required for the school despite the above measures, however, the demand on mechanical plant will be significantly reduced both in times of operation and peak loads. Intelligent use of natural ventilation is essential and a school operation manual is envisaged to guide staff in the best way to manage the school environment.

A range of mechanised solar space heating and solar, evaporative/rock bed, conventional evaporative and refrigerative air conditioning systems were examined for the school and the conventional systems selected due to the state of technical development of exotic systems. However, mechanical systems will be specially designed so as to be able to accommodate low energy plant - which will inevitably be developed at the first building refit.

6.4 LANDSCAPING

The landscaping has been designed in association with Permaculture Consultancy to enhance the environmental and educational aspects of the site. It will create an interesting and varied educational resource, with areas for different types of play applicable to the wide age range of the school, areas for study of biological and agriculture sciences at all levels of the curriculum, and will provide the building complex with a more sheltered and cooler site than presently exists.

A multi-facetted approach has been used. First priorities are the control of water run-off and erosion; the provision of water on site; restriction of foot traffic to stabilized paths; mulching of soils; the selection of a plant assembly to modify the school-ground micro-climate. The evolution of a plant assembly can proceed in stages. Children, parents, residents and staff should be encouraged to assist in the development of a more comfortable school environment. The problems, in human terms, are excessive heat, dust and wind in summer, soggy and muddy conditions in winter, and silt laden run-off from the bare slopes to the school areas.

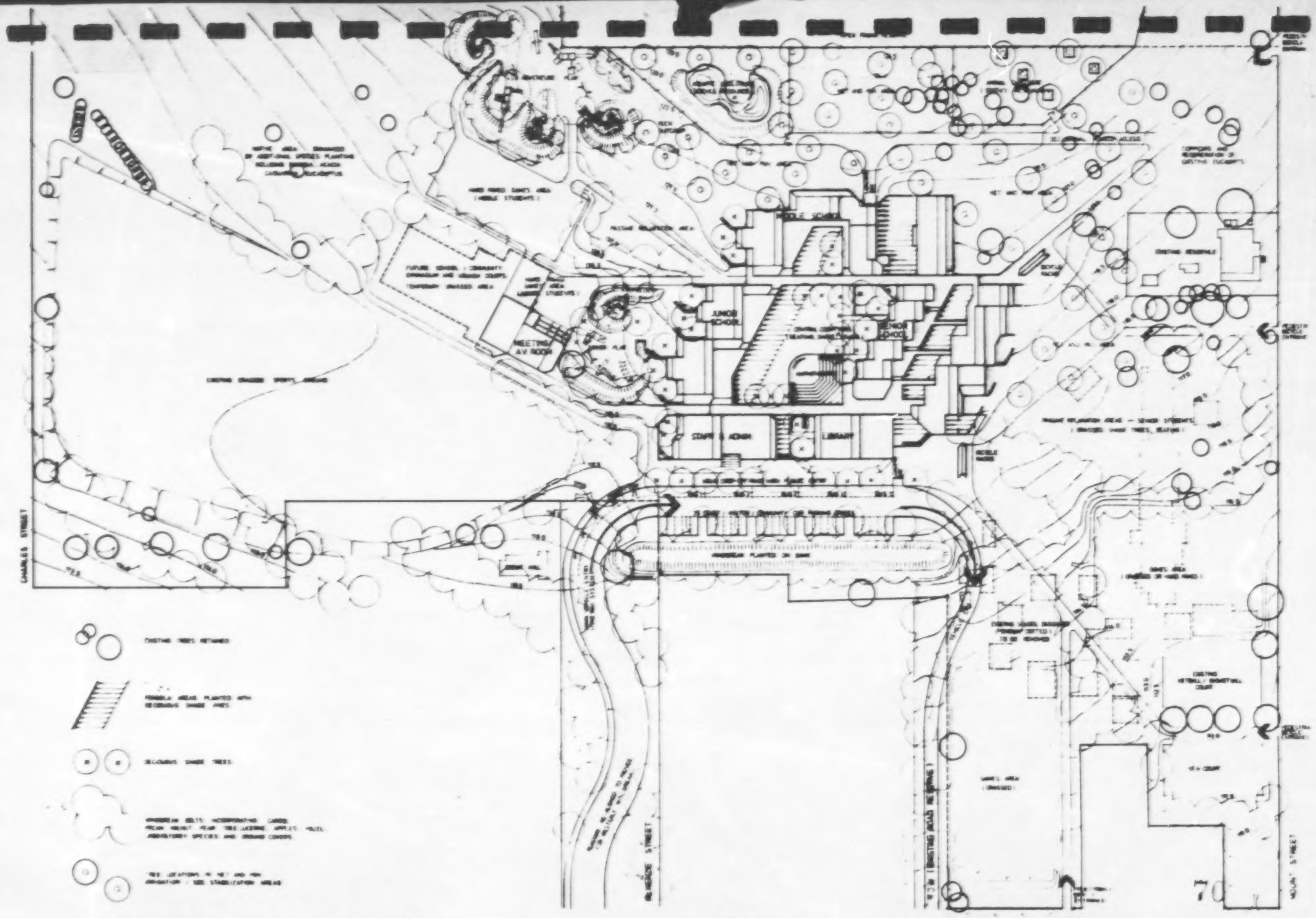
The site is on a windward slope, and the winds that carry dust and rain sweep more rapidly upslope than they do in more sheltered areas. Therefore, a broad windscreen of trees should be planted on all downslope areas in an arc about the western sector. This planting should be done as soon as possible and with the co-operation of the Scout Association, Church, and other neighbours, could be extended off site. Earth banks downslope, and below the parking area, plus tall fencing screens will greatly assist plant establishment and wind reduction.

Overlapped screens with vines can shield spaces between buildings and in the inner courtyard overhead trellises and shrubbery will reduce or eliminate turbulence effects within the complex; all factors will assist cooling effects in summer, and greatly moderate winter cold.

The site has been divided into three areas:

Firstly, the present school grounds, residence, and southerly aspect, is to be occupied mainly by plant species useful as a resource for windbreak and forage crops in the district as a whole. This planting could serve as a mother seed and trial forage resource for the whole district. These shelter belts would divide the area into smaller sizes, for the senior school's passive recreation games and sports practice.

Secondly, the central section of the site, adjacent to the new school, would be developed as a varied food plant resource for study and processing, using species which assist the passive energy conserving nature of the buildings eg. deciduous grape vines or almond trees where summer shading only, but a high transpiration rate is required for enhanced cooling effect. Most teaching rooms have access to sunny northern courtyards sheltered by screen walls,



WYCHEPROOF EDUCATION CENTRE

SITE PLAN

SWEETNAM AND GODFREY ARCHITECTS AND PLANNERS
15 HADDRA LANE MELBOURNE 3000 (03) 602 3855

SCALE 1:500
29 SEP 1978

and shaded southern areas for outdoor teaching or withdrawal groups. This outdoor space is also important for the natural ventilation and cooling of the buildings. The small remaining upslope area of rock would be developed in conjunction with the nature reserve with a soil stabilising net and pan irrigation system and with a small stream trickling through pools and rock basins, ultilised for marsh and aquatic species, and small water animals, leading to the inner courtyard pergolas and shrubbery.

Thirdly, the northern slope, already more established with planted native species, should be further developed by the planting of useful bee forage and other dry-land native species, and left more natural as a refuge and recreation area. This zone includes play grounds for the junior and middle schools, protected and separated by earth banks and heavy planting, a large hardpaved area for ball games, the existing flat grassy sports field, and the gymnasium complex.

The plant species will form a "Permaculture" - a complex system of useful plants which provide food, fibre and animal forage, as well as altering the microclimate by shading, sheltering and humidifying the air. The emphasis therefore is in planting a wide variety of useful species which complement and support each other, are hardy and are generally of low water needs.

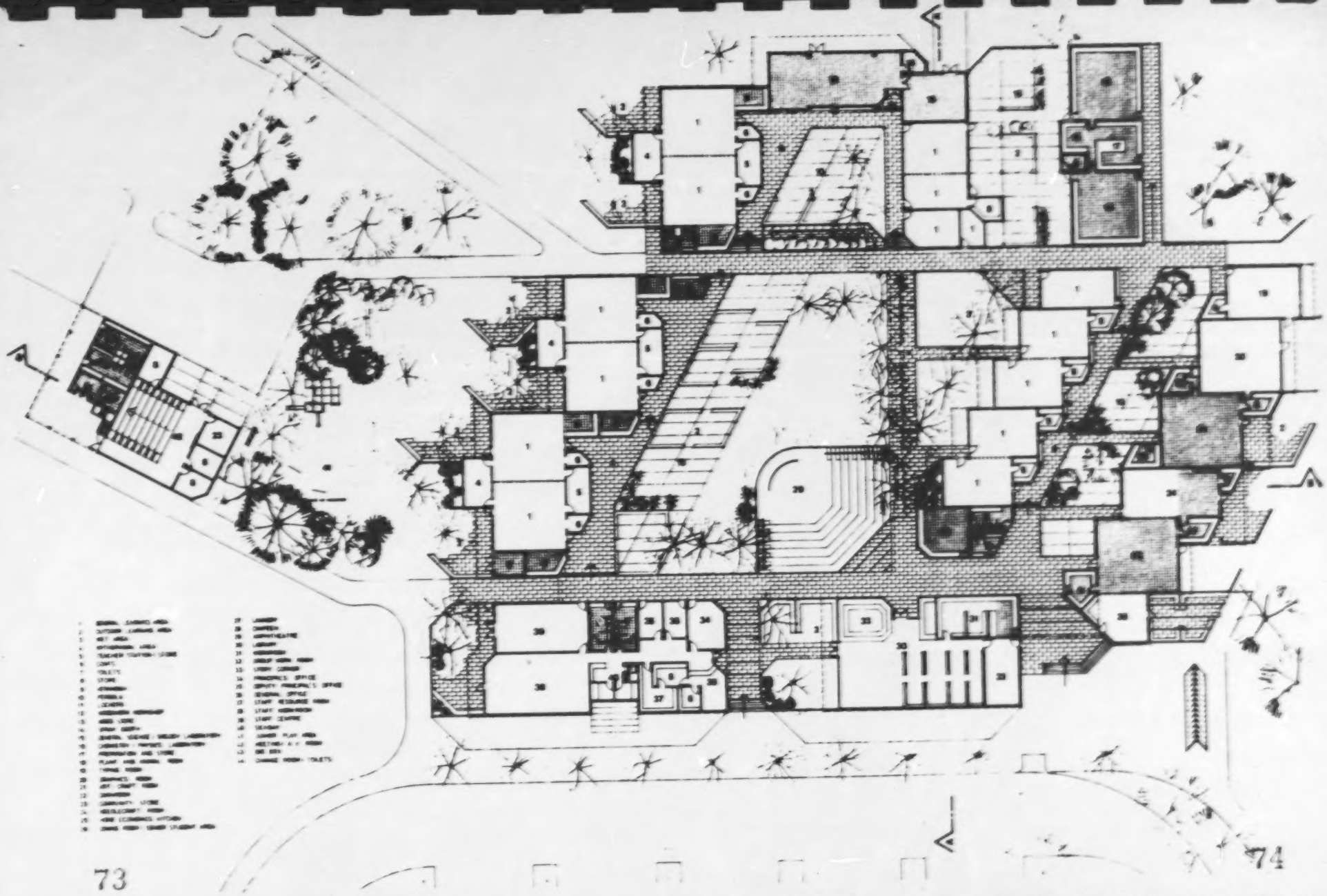
Site landscaping principles are illustrated on the accompanying Site Plan.

6.5 SCHEMATICS DRAWINGS

The following schematics drawings illustrate the design proposals for the school:

Site Plan
Floor Plan
Elevations
Sections
Axonometric View

Associated drawings - some appearing elsewhere in this report - show the Locality Plan, Site Zoning, School Zoning, Size and Capacity of Teaching Rooms.



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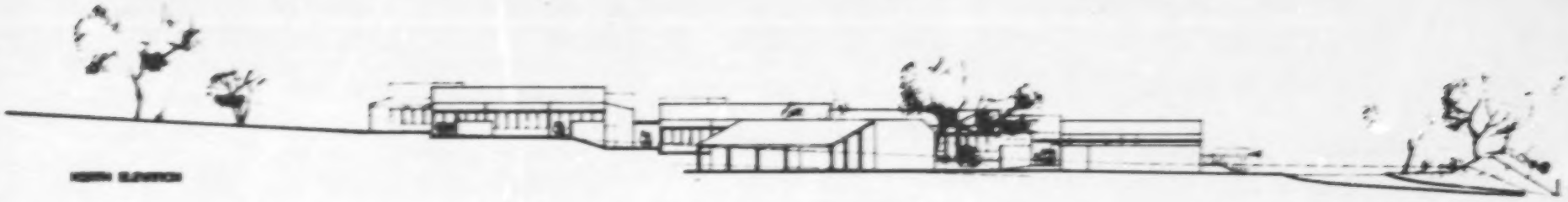
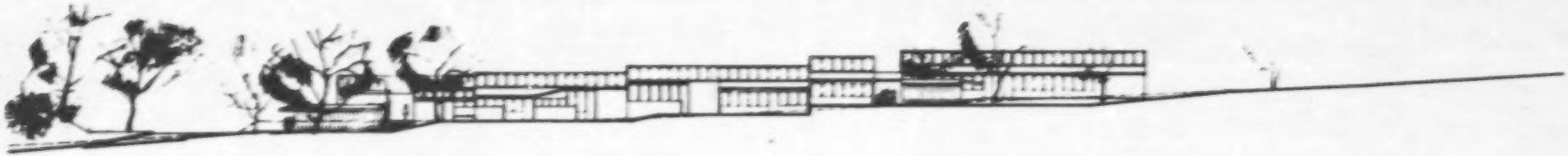
WYCHEPROOF EDUCATION CENTRE

FLOOR PLAN





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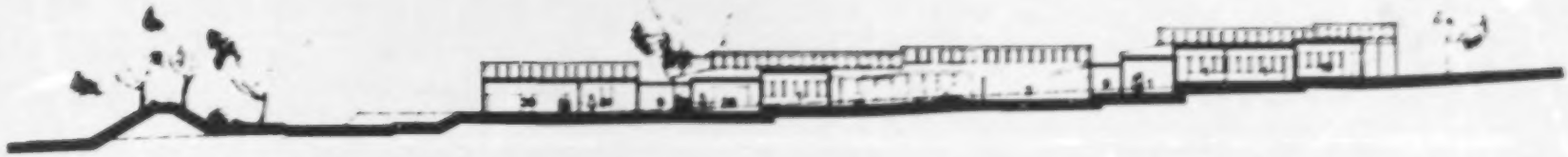
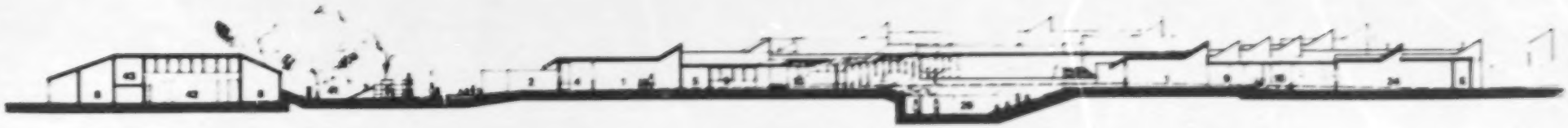
WYCHEPROOF EDUCATION CENTRE

ELEVATIONS



SECTION A-A



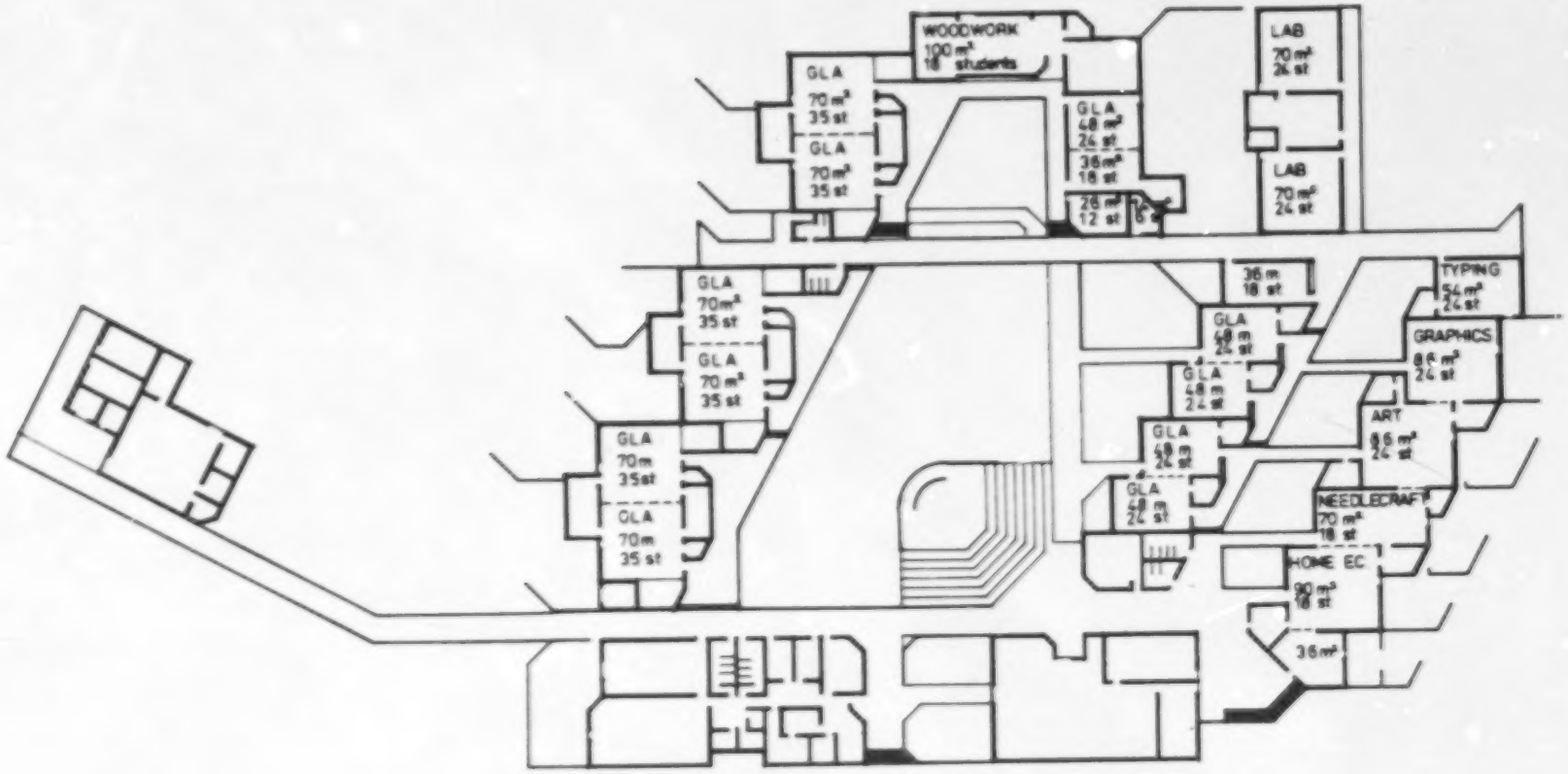
SECTION B-B

78

77

WYCHEPROOF EDUCATION CENTRE

SECTIONS



SIZE AND CAPACITY OF TEACHING ROOMS

60

80

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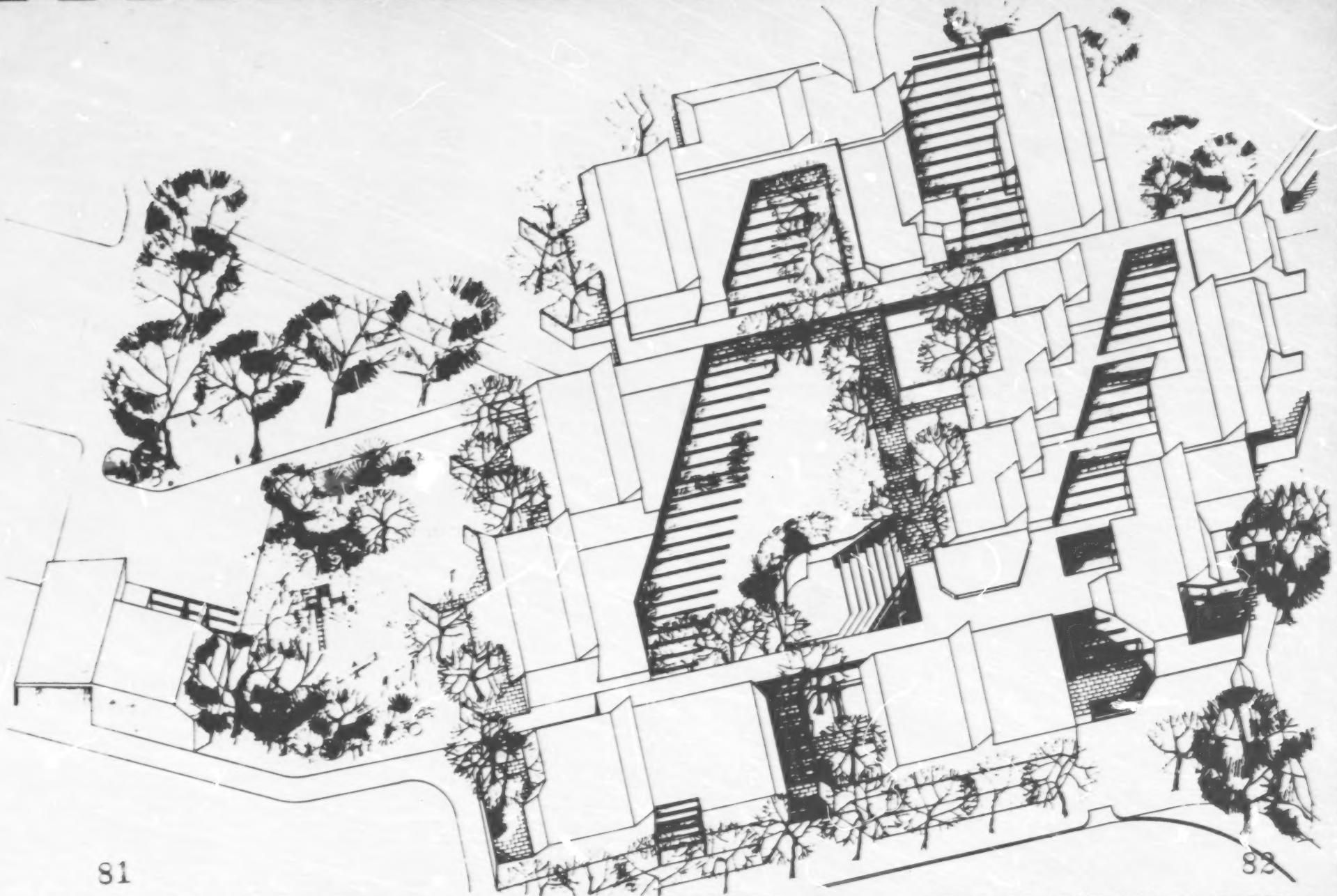

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WYCHEPROOF EDUCATION CENTRE

AXONOMETRIC VIEW

SWEETMAN AND GODFREY - ARCHITECTS AND PLANNERS
15 NIAGARA LANE MELBOURNE 3000 (03) 602 3655

SCALE 1:200
29 SEP 1976

VOB 77011
JMG 5.18

61

6.6 STAGING

The only definitive staging proposal at this time relates to the later construction of community sporting facilities which are proposed to be funded - to an as-yet-undetermined degree - by community resources and Youth, Sport and Recreation funds made available through the Shire Council. These facilities are incorporated in the project facilities brief summary and consist of a school/community gymnasium, two squash courts and extended public toilet/shower/change rooms. The location is illustrated on the Site Plan.

The School Council proposes to contribute to these later facilities with the value of site earthworks associated with the main school buildings. It is proposed that this work would be voluntarily contributed by local labour and plant for this purpose. This type of construction requires approval in principle by the Education Department.

Staging of the educational component of the complex has been given considerable study by the architect, the School Council and the Regional Office but at this time it is understood that the Minister is considering a single stage construction program in order to provide the opportunity for the P-12 concept experiment to be fairly tested in a satisfactory environment.

7.0 COST AND AREA ANALYSIS

Cost planning for schematics has been undertaken by Cameron and Middleton Australia Pty Ltd.

7.1 PROJECT BUDGET

Project Budget (including professional fees) at February 1978 prices	$ 2,200,000.00
Budget supplementation to September 1978 (7 months @ say plus 4%)	$ 90,000.00
Project Budget at September 1978 prices	$ 2,290,000.00

7.2 MAIN COST SUMMARY

Buildings including verandahs and covered ways	$ 1,345,000.00
Site works/site services including amphitheatre, paved outdoor learning areas, screen walls, landscaping etc.	$ 355,000.00
Sub-total	$ 1,700,000.00

b/f sub-total	$1,700,000.00
Design Variable/Contract Contingency	$ 130,000.00
Locality Allowance	$ 170,000.00
Total building cost on rise and fall at September 1978 prices	$2,000,000.00
Professional fees @ 11½%	$ 230,000.00
Total project cost on rise and fall at September 1978 prices	$2,230,000.00

Exclusions:

1 Air conditioning
2 Loose furniture and equipment
3 Cost increases from September 1978

7.3 AREA ANALYSIS

Note: FECA = Fully Enclosed Covered Area
UCA = Unenclosed Covered Area
GFA = Gross Floor Area

	FECA	UCA	GFA
Primary School	$664m^2$	$236m^2$	$900m^2$
Secondary School	$1285m^2$	$294m^2$	$1579m^2$
Joint Facilities	$906m^2$	$499m^2$	$1405m^2$
Community Facilities	(None in this stage of construction)		
Total School	$2855m^2$	$1029m^2$	$3884m^2$

For the purpose of approximate comparison with other schools, the joint facilities can be distributed pro-rata to the primary and secondary categories as follows:

	FECA	UCA	GFA
Primary School	974m^2	458m^2	1432m^2
Secondary School	1881m^2	571m^2	2452m^2
Total School	2855m^2	1029m^2	3884m^2

7.4 UNIT AREA ANALYSIS

Unit area analysis has been undertaken using the above pro-rata primary and secondary gross floor areas on the following bases:

	Primary	Secondary	Total
1978 Actual Enrolment	179	175	354
GFA per 1978 Actual Enrolment	8.00m^2	14.01m^2	10.97m^2
Mean Projected Enrolment (to 1985)	170	195	365
GFA per Mean Projected Enrolment	8.42m^2	12.57m^2	10.64m^2
Peak Projected Enrolment (to 1985)	179	221	400
GFA per Peak Projected Enrolment	8.00m^2	11.10m^2	9.71m^2
Student Stations in Learning Areas	210	378	588
GFA per Student Stations	6.82m^2	6.49m^2	6.61m^2

7.5 COST ANALYSIS

The following figures have the same inclusions and exclusions as the total project cost figure in Section 7.2

	Building Cost	Proportion of Site Works Cost	Total Cost
Primary School	$400,000	$110,000	$510,000
Secondary School	$740,000	$190,000	$930,000
Joint Facilities	$620,000	$170,000	$790,000
Community Facilities	(None in this stage of construction)		
Total School	$1,760,000	$470,000	$2,230,000

On a similar basis to the area analysis, the joint facilities costs can be distributed pro-rata to the primary and secondary categories as follows. This will serve for approximate cost comparisons only and may tend to favour the secondary school component, due to the nature of the joint facilities.

	Building Cost	Proportion of Site Works Cost	Total Cost
Primary School	$ 640,000	$170,000	$ 810,000
Secondary School	$1,120,000	$300,000	$1,420,000
Total School	$1,760,000	$470,000	$2,230,000

7.6 UNIT COST ANALYSIS

The unit cost analysis employs the above pro-rata primary and secondary component costs, which are inclusive of professional fees, but exclude allowance for air conditioning, and are base dated to September 1978.

	Primary	Secondary	Total
Student Place Costs			
Cost per 1978 Actual Enrolment	$4,525	$8,114	$6,299
Cost per Mean Projected Enrolment	$4,765	$7,282	$6,110
Cost per Peak Projected Enrolment	$4,525	$6,425	$5,575
Cost per Student Station	$3,857	$3,757	$3,793
Area Costs			
Cost per square metre (GFA)	$ 566	$ 579	$ 574